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(54) Manufacture of moulding blanks in sheet form

(57) A process of moulding blanks in sheet form comprises forming a fleece of lignocellulose-containing particles together with at least one thermoplastic binder on a substrate and then heating the material to the processing temperature of the binder and pressing the material into sheets, the process including a finishing/pressing step in which the sheets are cooled. Preferably, the mixture of lignocellulosic and thermoplastic particles (e.g. 60:40 wood particles:binder) is first precompressed and then heated and cold finish/pressed. The mixture may additionally be heated before or during the precompression step. A separate final cooling step is not necessary, and the blanks can be directly stacked for storage.

The finished blanks can subsequently be post-formed under heat and pressure to make a variety of products.

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SPECIFICATION

Manufacture of moulding blanks in sheet form

5 The invention generally relates to a process for the manufacture of moulding blanks from lignocellulose-containing particles and one or more thermoplastic binders by heating and compressing a fleece formed of a mixture of these materials.

10 Moulding blanks of this type are sheet materials (e.g. 1 to 6 mm thick) which can be post-formed three-dimensionally. The properties of the product are determined by the basic materials, wood and plastic. Wood is light, elastic and statically stabilising due to the particular form used, and thermoplastic material is formable and resistant to moisture, decomposition and heat. Thus, for example, the starting material may be a mixture of about 60% wood particles with about 40% thermoplastic binder, by weight, and sheets made of this material open up areas of application which have hitherto been dominated by pure plastic.

In general, in the known method, dried wood particles, mixed with particulate thermoplastic binder, are introduced into a moulding machine which deposits the starting material in metered quantities onto an endless fleece carrier which then passes through a preheating station and a heated finishing press, after which a cooling station is arranged.

30 The fleece carrier then transfers the blank web to a trimming and cross-cutting station, after which the individual blanks are stored. Moulding blanks can be stored in stacks and then shaped by heating in a press, either where they are manufactured or at another factory, and they can then, if required, also be subjected to a stamping operation to give the finished moulded article.

We have now found a way of producing the moulding blanks so that they can be temporarily stored in stacks immediately after the finishing pressing thereof. In our process, the material, heated to the required processing temperature of the thermoplastic binding agent (which is generally above the softening temperature of the thermoplastic, e.g. about 180°C), is cooled during the finishing/pressing operation. Consequently, there is no need for the previously necessary step of cooling the finish-pressed blank. The overall length of the manufacturing plant is thus shortened and product costs are reduced.

Thus, the invention provides a process for the manufacture of moulding blanks in sheet form which comprises forming a fleece of lignocellulose-containing particles together with at least one thermoplastic binder on a substrate and then heating the material to the processing temperature of the binder and pressing the material into sheets, the process including a finishing/pressing step in which the sheets are cooled.

60 Before the material is heated, either by means of ultra-high frequency (microwaves) or other heating sources acting in like manner and before cold finishing/pressing, the fleece is preferably pre-compressed. The fleece can be pre-compressed and heated simultaneously; however, the fleece can

also be heated even before pre-compression.

Ultra-high frequency heating may also be used in or before the pre-compressing step, but in this case also other heating methods can be used.

70 Although it is unimportant whether discontinuously operating or continuously operating presses can be used for the pre-compression or for the cold finishing/pressing, continuously operating presses are preferably used because idle times are thereby avoided and output can be increased.

75 Irrespective of whether production is carried out with discontinuously or continuously operating presses, the lignocellulose-containing particles mixed with the binder may for example be heated before a pre-compression operation, for example by ultra-high frequency, and heated immediately before the cold-operating finishing-press, preferably with ultra-high frequency energy. If continuous operation is adopted, the mixture of

85 lignocellulose-containing particles and the binder may be laid onto an endless fleece carrier and are then passed, for example, to an ultra-high frequency heater. The heated fleece may then be passed to a continuously operating pre-press, which can be designed to be unheated or heated. In this press, not only is the thickness of the fleece reduced, but also the air present in the fleece is expelled. The pre-compressed fleece can then be further heated, preferably by ultra-high frequency energy. However, a conventional radiant heat source can also be provided at this point.

After this second heating operation, in which the thermoplastic material or materials reach their processing temperature, the fleece can pass through an unheated, continuously operating finish press, whose upper press plate can be covered by a separating foil. The finished-pressed blank can immediately be stacked for storage, because the blanks have already been brought down to a temperature of, for example, 40°C and are storable without risk of deformation.

If the blank, or the moulded article made from a blank by post-forming, is to be covered, for example by one or more paper webs or sheets or by one or more plastic foils, such covering layers can be applied to the fleece before it is introduced into the cold-operating finishing press; this can be done before or after the fleece is heated.

115 Claims

1. A process for the manufacture of moulding blanks in sheet form which comprises forming a fleece of lignocellulose-containing particles together with at least one thermoplastic binder on a substrate and then heating the material to the processing temperature of the binder and pressing the material into sheets, the process including a finishing/pressing step in which the sheets are cooled.

2. A process as claimed in claim 1 which comprises pre-compressing the fleece, heating the material to the processing temperature and then cold finishing/pressing the material.

3. A process as claimed in claim 2 wherein the

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fleece is heated during the pre-compressing step.

4. A process as claimed in claim 2 wherein the fleece is heated before the pre-compressing step.

5. A process as claimed in any one of the preceding claims wherein ultra-high frequency heating is used in at least one heating step.

6. A process as claimed in any one of the preceding claims wherein the fleece contains about 60% wood particles and about 40% thermoplastic binder, by weight.

7. Moulding blanks when made by a process as claimed in any one of the preceding claims.

8. Articles when made by post-forming a moulding blank as claimed in Claim 7.

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